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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,607	04/30/2001	Gerard Harbers	PHNL 000222	4771

24737 7590 07/19/2007
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
XIAO, KE	
ART UNIT	**PAPER NUMBER**
2629	
MAIL DATE	**DELIVERY MODE**
07/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/846,607	HARBERS ET AL.	
	Examiner	Art Unit	
	Ke Xiao	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

In view of the Appeal Brief filed on April 10th, 2007, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uehara (US 4,772,885) in view of the applicant's admitted prior art (AAPA) and Yoshihara (US 6,155,016).

Regarding independent **Claim 1**, Uehara teaches an assembly comprising:

a display device provided with a pattern of pixels associated with color filters (Uehara, Fig. 3 element 63), and

an illumination system for illuminating the display device (Uehara, Fig. 3 element 43 and 51),

said illumination system comprising a light emitting panel and at least one light source, the light source being associated with the light-emitting panel (Uehara, Fig. 3 element 43 and 41),

the light source comprising at least three light emitting elements having different light-emission wavelengths (Uehara, Fig. 3 elements 43a, 43b, 43c),

the light-emitting elements being associated with the color filters (Uehara, Fig. 3 elements 43 and 63),

Uehara fails to teach wherein the light emitting elements are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also well known to be used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system is operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of a picture to be displayed by the display devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Regarding independent **Claim 13**, Uehara teaches a display device for use with an illumination system (Uehara, Fig. 3), comprising:

a liquid crystal display panel comprising a plurality of liquid crystal elements operable to selectively allow passage of light from the illumination system (Uehara, Fig. 3 element 19 and 21); and

at least one color filter operable to filter the light allowed to pass through one or more of the liquid crystal elements to produce one or more pictures (Uehara, Fig. 3 element 63);

wherein the illumination system drives at least three electroluminescent light sources having different light-emission wavelengths (Uehara, Fig. 3, 43a, 43b, 43c).

Uehara fails to teach wherein the light sources are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system is operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of a picture to be displayed by the display

devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Regarding **Claim 14**, Uehara teaches an illumination system for use with a display device (Uehara, Fig. 3), comprising:

a light-emitting panel (Uehara, Fig. 3 element 21);

at least one light source associated with the light-emitting panel, the at least one light source comprising at least three light emitting elements having different light emission wavelengths, the light-emitting elements associated with color filters in the display device (Uehara, Fig. 3 elements 43 and 63); and

Uehara fails to teach wherein the light sources are light emitting diodes. The applicant's admitted prior art teaches that light emitting diodes are a well-known subset of electroluminescent devices and are also used in LCD backlights (AAPA, Pg. 1 paragraph [0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the LED backlights as taught by the AAPA in place of the generic electroluminescent backlights as taught by Uehara in order to increase the life span of the backlight (AAPA, Pg. 1 paragraph [0010]).

Uehara as modified by the AAPA fails to teach that the illumination system further comprises a controller operable to drive the at least three light-emitting diodes to separately control the intensity of light emitted as claimed. Yoshihara teaches an LED illumination system with a controller operable to drive three light emitting diodes to separately control the intensity of light emitted in at least one of the different light emission wavelengths and thereby change a color temperature and illumination level of a picture to be displayed by the display devices, wherein an intensity of the light emitted by the light-emitting diodes varies in response to an illumination level of the picture to be displayed by the display device (Yoshihara, Col. 2 lines 10-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the intensity control as taught by Yoshihara in the backlight system of Uehara as modified by the AAPA in order to allow for better white light reproduction.

Regarding **Claim 2**, Uehara as modified by the AAPA and Yoshihara further teaches that the light source comprises three light-emitting diodes having different light-emitting wave lengths (Uehara, Fig. 3 elements 43a, 43b, 43c), and

the color filter comprises three color filters (Uehara, Fig. 3, 63a, 63b, 63c),

a spectral emission of each one of the three light-emitting diodes being substantially adapted to a spectrum of one of the color filters (Uehara, Fig. 3 elements 43 and 63).

Regarding **Claim 3**, Uehara as modified by the AAPA and Yoshihara further teaches he light source comprises at least one blue light-emitting diode, at least one

green light-emitting diode and at least one red light-emitting diode (Uehara, Fig. 4 elements 43a, 43b, 43c),

the color filter comprises a blue, a green and a red color filter (Uehara, Fig. 4 elements 63a, 63b, 63c), and

in operation, the blue color filter predominantly passes light originating from the blue light emitting diode, the green color filter predominantly passes light originating from the green light emitting diode, the red color filter predominantly passes light originating from the red light emitting diode (Uehara, Fig. 4 elements 43 and 63).

Regarding **Claim 4**, Uehara as modified by the AAPA and Yoshihara further teaches that at least one of the light-emitting diodes is chosen such that the wavelength associated with a spectral maximum of the light-emitting diodes corresponds to a wavelength associated with a spectral maximum of the corresponding color filter in the visible spectrum (Uehara, RGB light sources to RGB filters).

Regarding **Claim 5**, Uehara in view of the AAPA and Yoshihara further teaches that the wavelength lamda.ledmax associated with the spectral maximum of at least one of the light-emitting diodes and the wavelength lamda.cfmax associated with the spectral maximum of the corresponding color filter meet the relation: | lamda.ledmax - lamda.cfmax | <=5nm (Uehara, Figs. 7 and 8 clearly show that the wavelength of the diode and the corresponding filter match which satisfies the claimed limitation).

Regarding **Claim 6 and 7**, Uehara in view of the AAPA and Yoshihara further teaches that LEDs used for backlight often have spectral bandwidth in the range between 15nm <= FWHM <= 30nm (AAPA, Pg. 3 paragraphs [0036-0037]).

Regarding **Claim 9**, Uehara in view of the AAPA and Yoshihara further teaches that the intensity of the light emitted by the light-emitting diodes can be adjusted on a frame-to-frame basis (Yoshihara, Fig. 4, Col. 6 lines 20-52, specifically the intensity can be adjusted from frame to frame because the image being displayed can change from frame to frame).

Regarding **Claim 10**, Uehara in view of the AAPA and Yoshihara further teaches that the intensity of the light emitted by the light-emitting diodes can be adjusted for each color on a frame-to-frame basis (Yoshihara, Fig. 4, Col. 6 lines 20-52).

Regarding **Claim 11**, Uehara in view of the AAPA and Yoshihara further teaches that the each of the light emitting diodes has a luminous flux of at least five lumens (AAPA, Pg. 4 paragraph [0046]).

Regarding **Claim 12**, Uehara in view of the AAPA and Yoshihara fails to teach that the light emitting diodes are mounted on a printed circuit board. The examiner takes official notice that mounting LEDs on PCBs is well known in the backlight display art. It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the LEDs of Uehara on a PCB instead of the generic plate and electrode setup in order to simplify manufacturing and increase reliability.

Regarding **Claims 15-17, 19 and 20**, Uehara fails to teach that the picture to be displayed by the display device is associated with one of a plurality of emission standards, each emission standard associated with a standardized color triangle; and

The illumination system is operable to tune the light emitting diodes such that the display device displays the picture in accordance with the standardized color triangle of the emission standard associated with the picture.

The AAPA teaches that it is well known in the art that pictures being displayed are associated with a plurality of international emission standards such as NTSC, EBU and HDTV, which are inherently associated with a standardized color triangle (AAPA, Pg. 2 paragraphs [0019-0021]). Since the illumination system of Uehara as modified above is capable of adjusting the white balance of the illumination, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the illumination system of Uehara as modified above to be operable to tune the light emitting diodes such that the display device displays the picture in accordance with the standardized color triangle of the emission standard, such as NTSC, EBU and HDTV, associated with the picture, in order to provide white balancing for a wide variety of international standards and thereby expand the usability of the display.

Regarding **Claim 18**, Uehara in view of the AAPA and Yoshihara further teaches that at least one color filter comprises blue, green, and red color filters (Uehara, Figs. 3-4 elements 63a-63c).

Response to Arguments

Applicant's arguments with respect to Claims 1-7 and 9-20 have been considered but are moot in view of the new ground(s) of rejection.

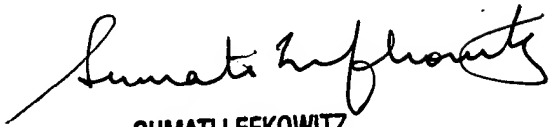
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ke Xiao whose telephone number is (571) 272-7776. The examiner can be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 11th, 2007 - kx -



SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER